

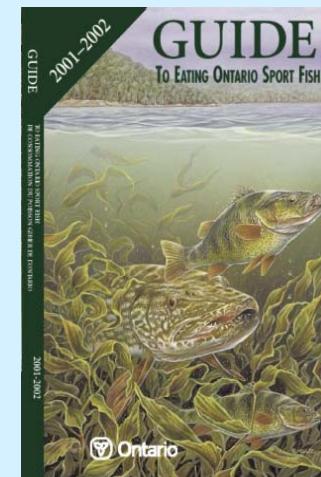
Lake Huron Symposium:

Critical Pollutants Related
to the Fisheries
of Lake Huron



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Surface Water Quality Division

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Ontario Ministry of the Environment
Sport Fish Contaminant Monitoring Program



Michigan Department of Environmental Quality Fish Contaminant Monitoring Program

- Edible Portion Monitoring (70%)
- Whole Fish Trend Monitoring (25%)
- Caged Fish Monitoring (5%)

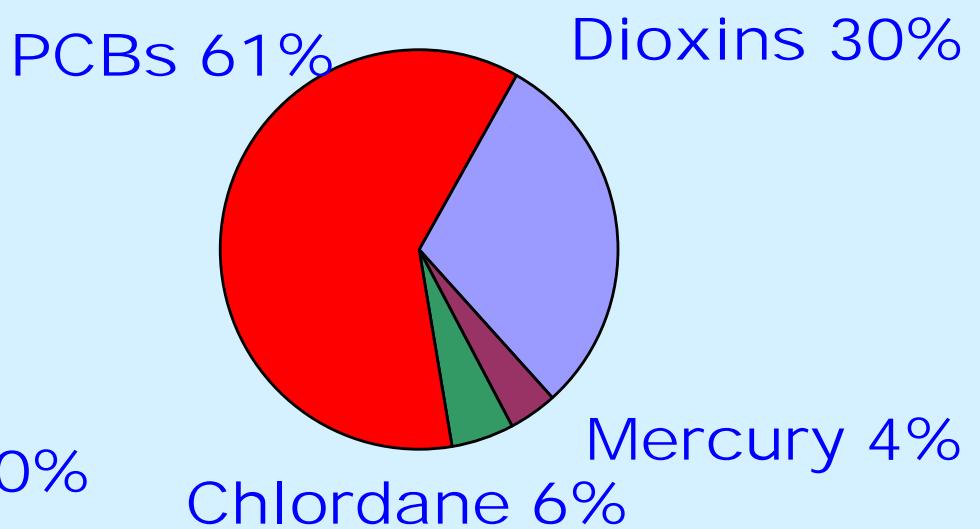
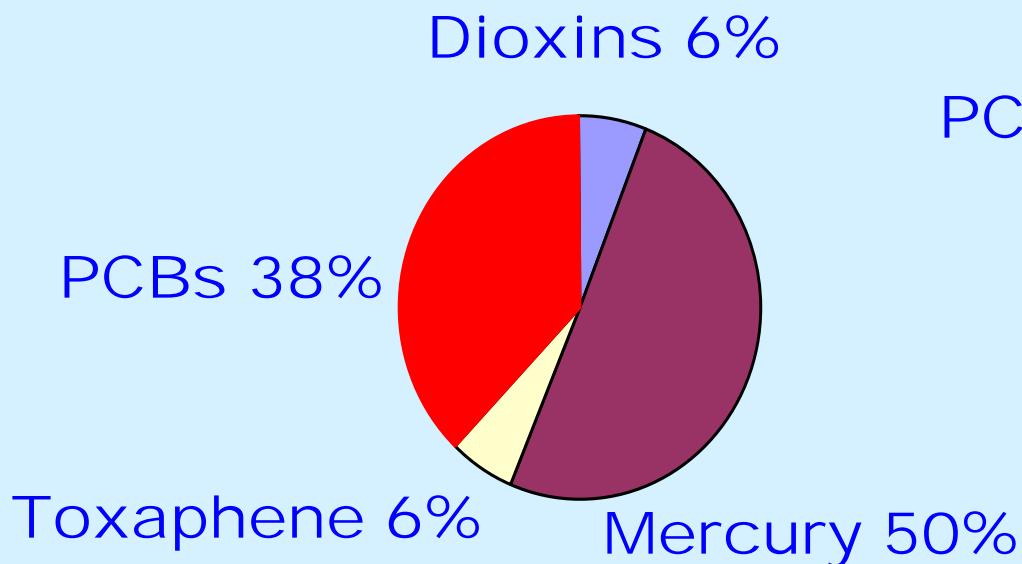
Ontario Ministry of the Environment Sport Fish Contaminant Monitoring

- Edible Portion Monitoring - Skinless boneless dorsal fillet (with few exceptions)

Contaminant Concentration Criteria

<u>Contaminant</u>	<u>Sample</u>	<u>Type</u>	<u>Concentration</u>	<u>Source</u>
Total PCBs		Fillet	0.05 ppm	Gt. Lks. States
Total PCBs		Fillet	0.5 ppm	OMOE
Total PCBs		Fillet	2.0 ppm	USFDA
Dioxin (TEQ)		Fillet	10 ppt	MDCH, OMOE
Dioxin (TEQ)		Fillet	25 ppt	USFDA
Total DDT		Fillet	5.0 ppm	MDCH, OMOE, USFDA
Total DDT		Whole	1.0 ppm	GLWQA
Toxaphene		Fillet	5.0 ppm	USFDA, MDCH
Toxaphene		Fillet	0.2 ppm	OMOE
Total Chlordane		Fillet	0.3 ppm	USFDA, MDCH
Total Chlordane		Fillet	0.05 ppm	OMOE
Mercury		Fillet	0.5 ppm	MDCH
Mercury		Fillet	0.45 ppm	OMOE
PBB		Fillet	0.3 ppm	MDCH
Mirex		Whole	< detection	GLWQA

Consumption Limiting Contaminants in Lake Huron



Ontario Waters

Michigan Waters

Total PCBs

Lake Huron Edible Portion Samples

Criteria: 0.05 ppm (Great Lakes States)

<u>Species</u>	<u>Number Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	<u>Year</u>
Brown Trout	37 of 37	1.2	0.65	1990-93
Burbot	4 of 4	0.37	0.98	1990
Carp	47 of 48	8.45	2.36	1991-99
Channel Catfish	38 of 38	2.9	1.0	1991-99
Chinook Salmon	30 of 30*	1.1	0.67	1991-98
Coho Salmon	6 of 6*	0.57	0.29	1996-98
Lake Trout	58 of 58	2.9	0.86	1991-96
Lake Whitefish	65 of 65	0.96	0.25	1992-99
Northern Pike	5 of 5	0.32	0.094	1993
Rainbow Trout	20 of 20	1.1	0.52	1991-93
Walleye	68 of 68	1.7	0.24	1991-99
White Bass	11 of 11	2.3	1.50	1993
White Perch	7 of 7	0.55	0.45	1994
White Sucker	30 of 30	1.1	0.18	1991-93
Yellow Perch	24 of 29	0.38	0.078	1991-93

*Composite Samples

Total PCBs

Lake Huron Watershed Edible Portion

Criteria: 0.05 ppm (Great Lakes States)

<u>Location</u>	<u>Species</u>	<u>Number Exceeding</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	<u>Year</u>
Au Sable River	Carp	20 of 20	6.9	1.1	1997-99
	Walleye	7 of 9	0.48	0.26	1997-99
Bad River	Channel Catfish	10 of 10	2.3	1.4	1994
	Northern Pike	4 of 4	0.13	0.08	1994
Cass River	Carp	10 of 10	2.6	0.56	1992
	Channel Catfish	10 of 10	7.6	1.3	1992
	Northern Pike	5 of 5	0.30	0.20	1992
Cheyboygan Cr.	Carp	10 of 10	8.3	4.0	1994
Flint River	Carp	19 of 19	9.1	0.64	1993-98
	Sm. Bass	10 of 10	0.26	0.12	1998
Saginaw River	Carp	10 of 10	24.7	3.4	1992
Shiawassee River	Carp	10 of 10	6.7	2.0	1995
	Northern Pike	3 of 3	0.4	0.2	1995
St. Mary's River	Carp	9 of 9	1.4	0.3	1995
	Northern Pike	2 of 9	0.2	0.03	1995
	Walleye	13 of 15	1.6	0.3	1991-95
	Yellow Perch	0 of 10	<0.025	<0.025	1995
	Carp	6 of 6	2.8	0.5	1993
Thread River	Carp	13 of 13	9.5	1.8	1992-99
	Walleye	4 of 4	1.6	0.7	1992
	White Bass	10 of 10	4.4	1.8	1995
	White Sucker	10 of 10	0.7	0.4	1995
	Smallmouth bass	5 of 5	0.24	0.15	1999

Apparent Toxaphene

Lake Huron Watershed Edible Portion Samples

Criteria: 0.2 ppm (OMOE)

<u>Location</u>	<u>Species</u>	<u>Number Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	<u>Year</u>
Lake Huron	Brown Trout	30 of 37	0.50	0.22	1990-93
	Channel Catfish	3 of 38	0.75	<0.05	1991-99
	Lake Trout	57 of 58	1.2	0.42	1991-98
	Lake Whitefish	20 of 65	0.45	0.15	1992-99
	Rainbow Trout	6 of 20	0.50	0.11	1991-93
	Walleye	3 of 68	0.22	<0.05	1991-99
St. Mary's R.	Walleye	7 of 15	1.0	0.18	1991-95

2,3,7,8-TCDD Toxic Equivalents

Lake Huron Edible Portion Samples

Criteria: 10 ppt (MDCH,OMOE)

<u>Species</u>	<u>Location</u>	Number			<u>Years</u>
		<u>Exceeding 10 ppt</u>	<u>Maximum (ppt)</u>	<u>Median (ppt)</u>	
Carp	Saginaw Bay	12 of 15	107.6	16.0	1991
Carp	Thunder Bay	2 of 6	46.7	6.6	1999
Channel Catfish	Saginaw Bay	4 of 10	19.3	8.8	1999
Lake Trout	Port Austin	10 of 20	28.4	10.0	1991-96
Lake Trout	Saginaw Bay	8 of 10	25.6	11.6	1993
Lake Trout	Thunder Bay	7 of 8	16.8	12.2	1993
Lake Whitefish	Port Austin	6 of 10	47.1	13.1	1996
Lake Whitefish	Thunder Bay	4 of 10	16.8	8.2	1998
Lake Whitefish	Thunder Bay	3 of 10	16.8	8.0	1999
Walleye	Saginaw Bay	0 of 10	5.3	1.5	1994

2,3,7,8-TCDD Toxic Equivalents

Lake Huron Watershed Edible Portion Samples

Criteria: 10 ppt (MDCH, OMOE)

<u>Location</u>	<u>Species</u>	<u>Number Exceeding Criteria</u>	<u>Maximum (ppt)</u>	<u>Median (ppt)</u>	<u>Years</u>
Cass River	Carp	2 of 5	25.5	7.0	1992
Cass River	Channel catfish	4 of 5	56.7	24.6	1992
Saginaw River	Carp	6 of 6	55.6	40.2	1992
Tittabawassee R.	Carp	11 of 11	373.4	43.0	1992-99
	Walleye	0 of 2	4.4	4.1	1992
	White Bass	6 of 10	23.8	14.4	1995
	Smallmouth Bass	2 of 5	12.8	9.9	1999

Total Chlordane

Lake Huron Watershed Edible Portion Samples

Criteria: 0.3 ppm (MDCH, USFDA)

<u>Location</u>	<u>Species</u>	<u>Number Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	<u>Year</u>
Au Sable River	Carp	1 of 10	0.493	0.05	1998
Cheboygan Cr.	Carp	1 of 10	0.31	0.10	1994
Lake Huron	Lake Trout	8 of 58	0.45	0.16	1991-96
	Channel Catfish	1 of 38	0.63	0.06	1991-99
Saginaw River	Carp	1 of 10	0.41	0.17	1992
St. Mary's River	Walleye	1 of 15	0.33	0.066	1991-95
Tittabawassee R.	Carp	1 of 3	0.42	0.05	1992-99

Total DDT

Lake Huron

Criteria: 1.0 ppm in whole fish (GLWQA)

<u>Species</u>	<u>Sample type</u>	Number			<u>Year</u>
		<u>Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	
Carp	Fillet	5 of 48	1.5	0.47	1991-99
Carp	Whole	7 of 80	1.7	0.48	1990-99
Channel Catfish	Fillet	1 of 38	2.8	0.24	1991-99
Lake Trout	Fillet	4 of 58	1.4	0.42	1991-96
Lake Trout	Whole	1 of 40	1.1	0.51	1992-98
Walleye	Fillet	1 of 68	1.1	0.052	1991-99
Walleye	Whole	5 of 84	1.7	0.41	1990-98

Total DDT

Lake Huron Watershed

Criteria: 1.0 ppm in whole fish (GLWQA)

<u>Location</u>	<u>Species</u>	<u>Sample Type</u>	<u>Number Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	<u>Year</u>
Cheboyganing Creek	Carp	Fillet	2 of 10	1.8	0.68	1994
Flint River	Carp	Fillet	1 of 29	1.8	0.11	1993-98
Pine River	Carp	Whole	21 of 22	161	45.5	1994-97
	Sm. Bass	Fillet	10 of 10	21.4	9.2	1997
Saginaw River	Carp	Fillet	4 of 10	2.3	0.61	1992
St. Mary's River	Carp	Whole	1 of 30	1.1	0.29	1993-98
	Carp	Fillet	1 of 9	2.0	0.17	1995
	Walleye	Whole	1 of 40	2.1	0.38	1991-98
	Walleye	Fillet	1 of 15	1.1	0.17	1991-95
Tittabawassee River	Carp	Whole	1 of 3	2.9	0.12	1992
	Carp	Fillet	6 of 13	3.8	0.91	1992-99

Total Mercury

Lake Huron Watershed

Edible Portion Samples

Criteria: 0.45 ppm (OMOE)

Number

<u>Location</u>	<u>Species</u>	<u>Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	<u>Year</u>
Au Sable R.	Carp	1 of 20	0.49	0.21	1997-99
	Walleye	3 of 9	0.55	0.37	1997-99
Bad River	Channel Catfish	3 of 10	0.71	0.36	1994
	Northern Pike	1 of 5	0.55	0.35	1994
Cass River	Channel Catfish	3 of 10	0.70	0.26	1992
Lake Huron	Channel Catfish	2 of 38	0.56	0.11	1991-99
	Lake Trout	3 of 68	0.70	0.16	1991-99
St. Mary's River	Northern Pike	1 of 9	0.57	0.26	1995
	Walleye	9 of 15	1.0	0.55	1991-95
	Carp	3 of 9	0.5	0.41	1995
Tittabawassee R.	White Bass	5 of 10	0.65	0.42	1995

PBB

(Firemaster BP-6)

Edible Portion Samples

Criteria: 0.3 ppm (MDCH)

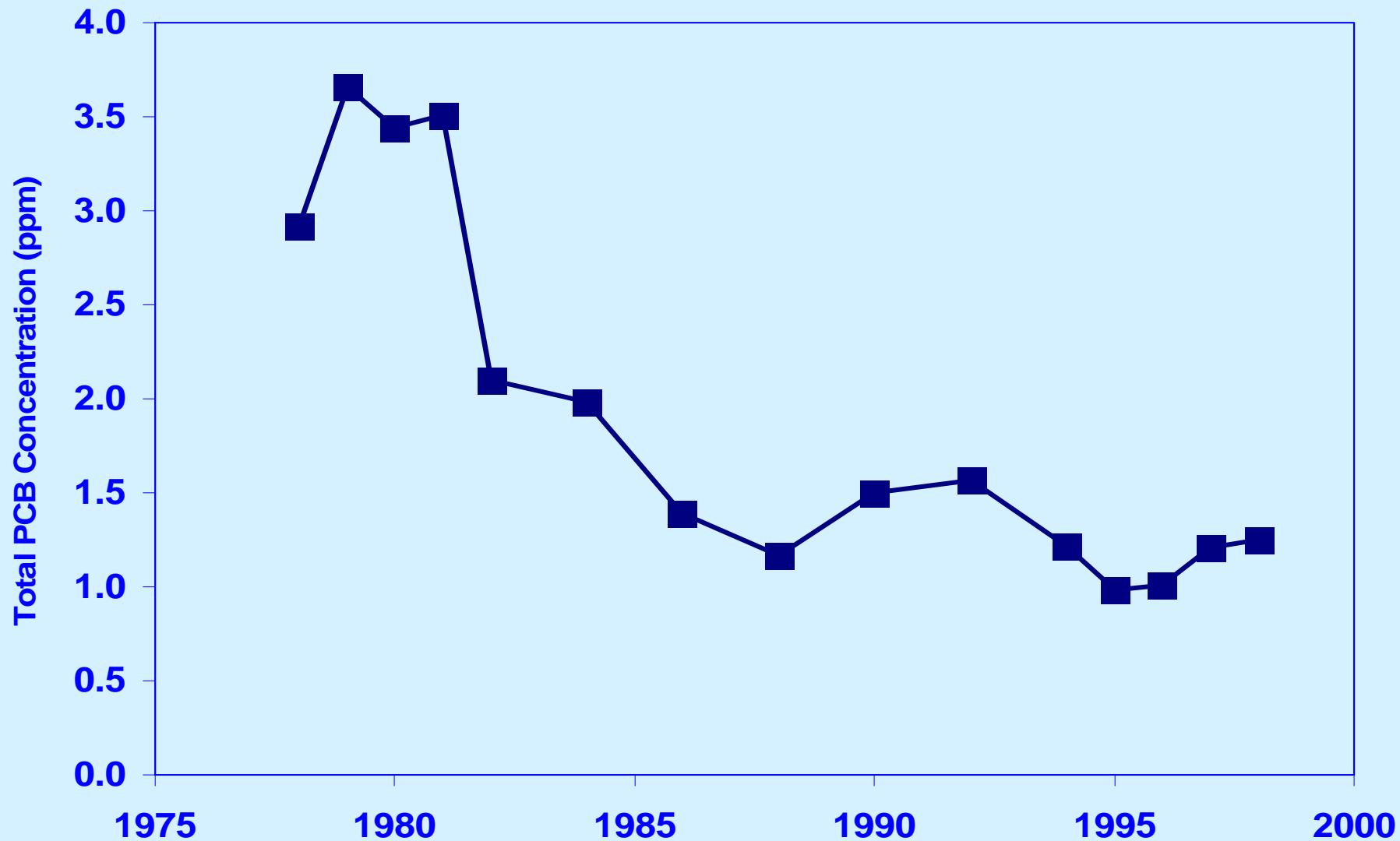
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		<u>Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	
Pine River	Black Crappie	9 of 10	1.45	0.74	1995
	Smallmouth Bass	1 of 10	0.8	0.18	1997

Mirex

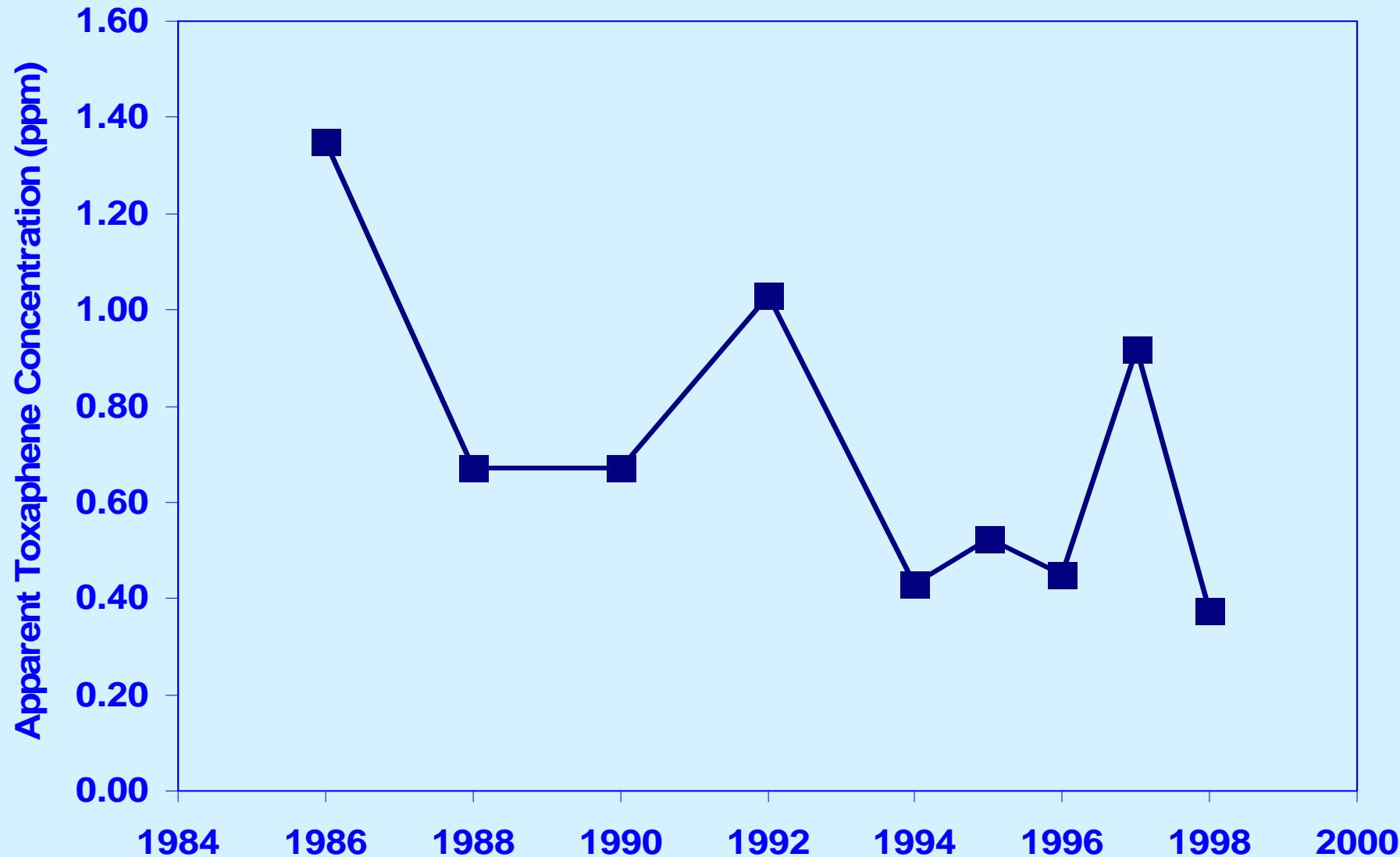
Criteria: “less than detection levels as determined by the best scientific methodology available” (GLWQA)

<u>Location</u>	<u>Species</u>	Number			<u>Year</u>
		<u>Exceeding Criteria</u>	<u>Maximum (ppm)</u>	<u>Median (ppm)</u>	
Lake Huron	Chinook	3 of 3	0.002	0.001	1998
	Coho	1 of 3	0.002	<0.002	1998

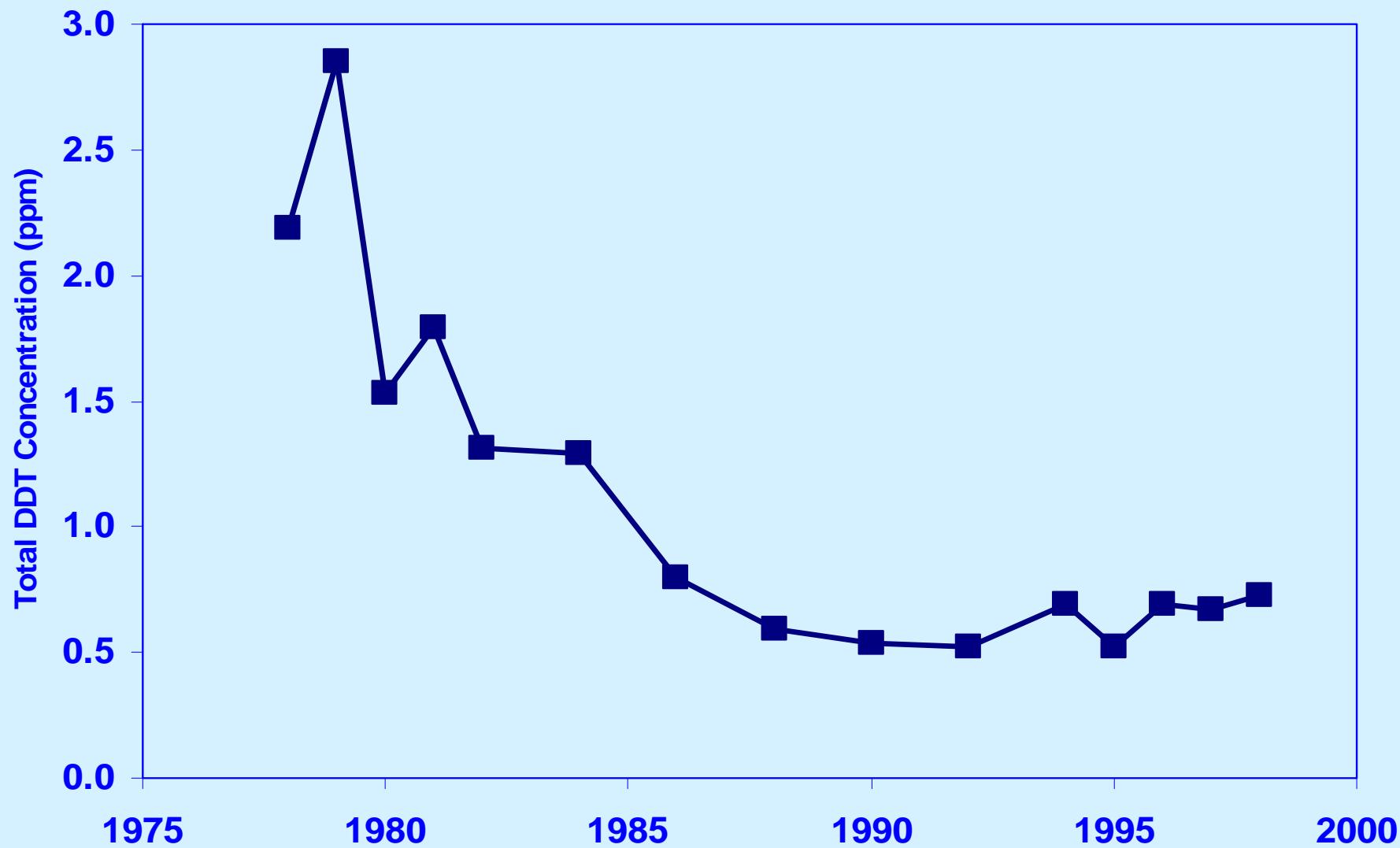
Lake Huron Whole Lake Trout Average Total PCB Concentrations



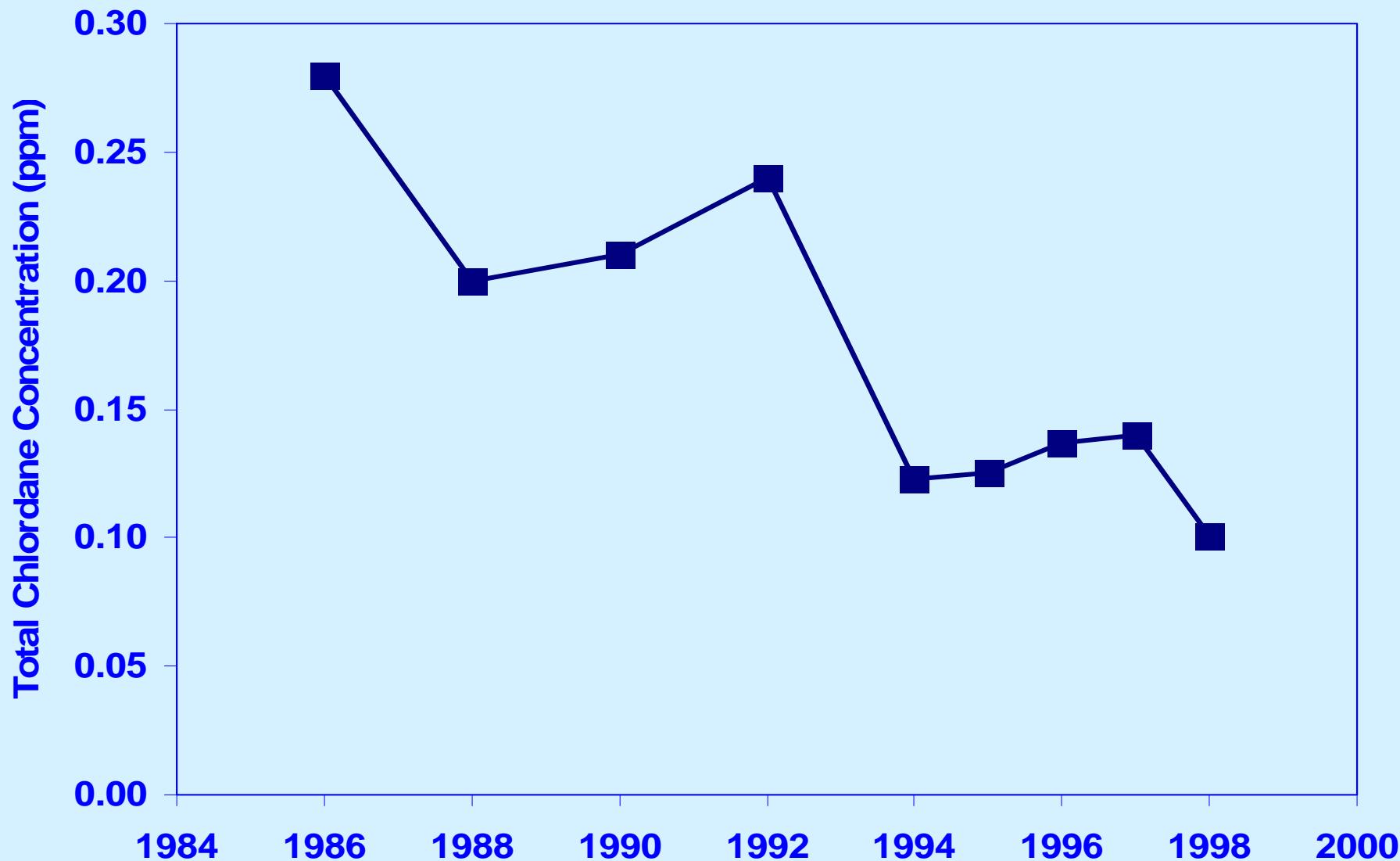
Lake Huron Whole Lake Trout Average Apparent Toxaphene Concentrations



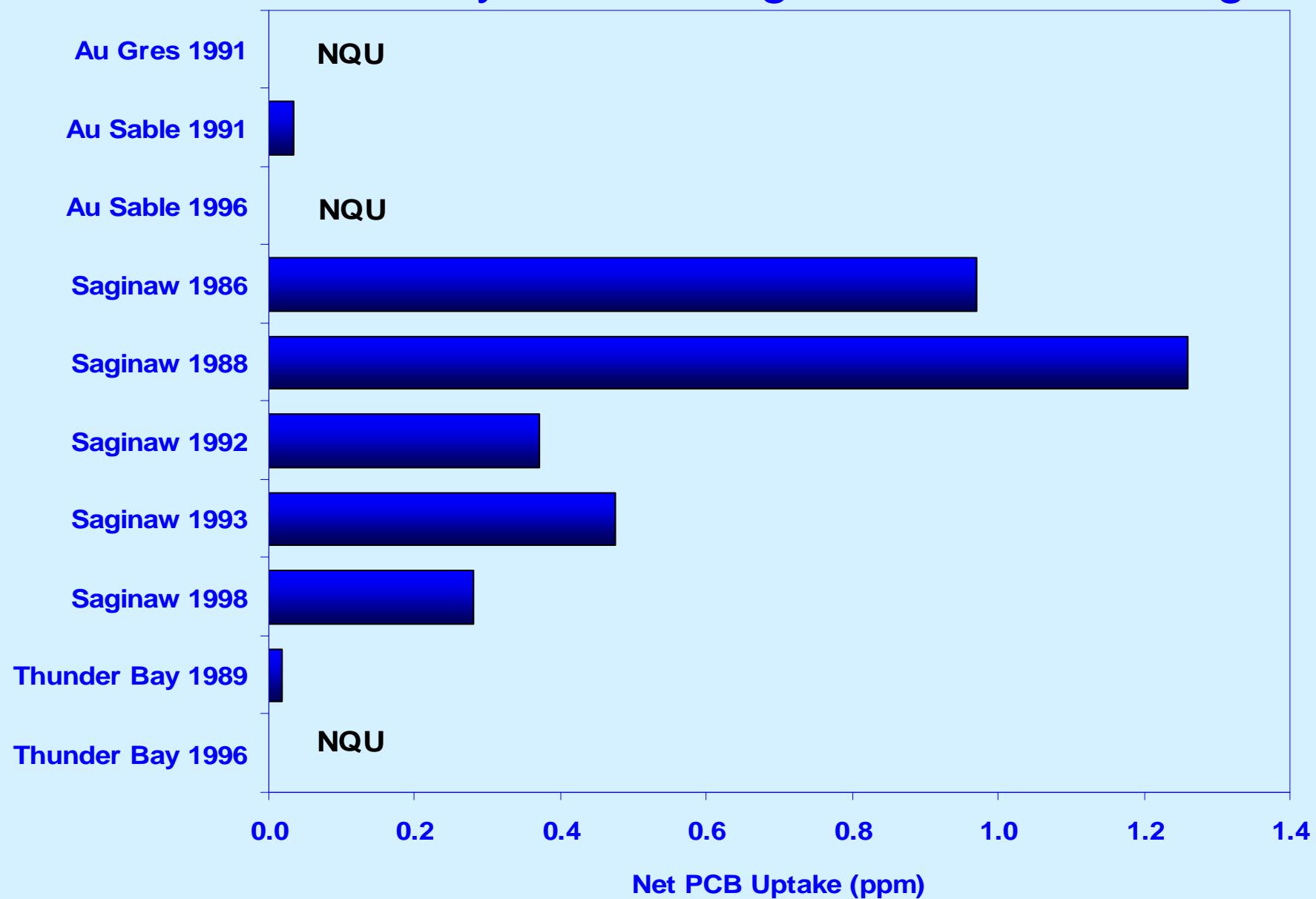
Lake Huron Whole Lake Trout Average Total DDT Concentrations



Lake Huron Whole Lake Trout Average Total Chlordane Concentrations



Tributary Mouth Caged Fish Monitoring



Saginaw River 1993 Caged Fish Study Total DDT Concentrations

